cyclonic disturbance central in the Ohio and Mississippi watersheds. The storm area was particularly well marked on November 8, 1897, as it moved from Illinois to the St. Lawrence Valley, and the system of south and west winds on its southeastern side extended as far as the southern stations in Florida, excepting only Key West. Above these lower winds were the cold westerly upper currents. The region of numerous thunderstorms attending this area of low pressure extended from Illinois to Massachusetts and southward to Tennessee, as shown by the figures above given. Occasional sporadic thunderstorms were reported on the 7th, 8th, and 9th, as follows: Arkansas, 0, 1, 0; Kansas, 2, 1, 0; Louisiana, 0, 2, 1; Kentucky, 0, 2, 0; Maine, 0, 0, 2; Maryland, 0, 0, 2; Michigan, 0, 2, 0; Mississippi, 0, 1, 0; Nebraska, 2, 0, 0; New Hampshire, 0, 1, 1; Rhode Island, 0, 0, 1; Texas, 0, 1, 0; West Virginia, 0, 0, 1. There is, therefore, no reason to doubt but that the disturbed electrical condition extended southeastward from the storm center into Florida, although of course the intensity of the disturbance in that region may have been exceedingly feeble. The temperature at Key West ranged between 65° and 75°, and one would, therefore probably have to ascend 10,000 feet before coming to a temperature of 32°. Between Key West and the storm center the whole country was covered with warm southerly winds, and the height of the isotherm of 32° may have been even more than 10,000 feet. In this region the disturbed electrical condition was relieved by the lightning flashes of the numerous thunderstorms. The air that was not thus suddenly brought to electric equilibrium could, by retaining some of its electric charge, eventually give rise to an aurora when its free electricity was being silently dissipated in gentle streams from the points of snow crystals and their elementary spiculæ.

MOONSHINE AND FROST.

Referring to an article under the above caption in the MONTHLY WEATHER REVIEW for March, 1898, Dr. J. W. Kales, M. D., Franklinville, N. Y., says:

The idea conveyed in that article is that frosts occurring before full moon are not injurious to vegetation, while frosts occurring after the full moon may be injurious.

During the night of May 12-13, 1895, a frost occurred in this section of New York State. It completely destroyed the grass crop and all growing crops; even killed the leaves on the trees, and in some places killed the trees. The leaves turned as brown as in October, and the meadows were as bare of grass as in September. In a word, it destroyed every kind of vegetation. The effects of this frost are still felt throughout this section. The full moon occurred on the evening of the 18th of May, 1895.

These facts are not in accord with this moon theory. Hence, like the other moon theories, this one is all "moonshine."

WATERSPOUTS.

The following extracts from newspapers refer to some special features of waterspouts which it is desirable to put on record.

From the Daily Globe, of June 21, Pensacola, Fla., we take the following:

On Monday, June 20, in the morning, a spout formed on the west side of Pensacola Bay, near Black Hammock, in the shape of a little whirl, and started across the bay in a straight line, gathering force and volume as it went, until it struck on the east bank, near the mouth of East Bay, where upon a sudden it seemed to make connection with an immense black funnel-shaped cloud, forming a complete tube to the water, which it sucked up in immense quantities. The rotary motion of the cloud or spout twisted off the tops of the pines, and they could be seen going up the spout as through an immense glass tube, the water and tree tops rushing up with fearful velocity, when of a sudden it [the spout] seemed to lift from the water, and, with a swiftly rolling motion, gradually drew up into the cloud, whither it gradually spread and disappeared over the expanse of sky.

Those who witnessed this immense waterspout state that it was the largest and most perfect one ever seen in these waters.

From the Press, July 19, Cleveland, Ohio, we take the following:

A remarkable cloud formation appeared in the northwest sky over the lake late in the afternoon of Monday, July 18. It was large and black and boiled and whirled in an angry manner. The shape was that of a cone lying on its side instead of point down like a tornado cloud. Above and beneath the threatening inky cloud the bright sun shone. Shortly after the cloud's first appearance the sky became fully overcast and a heavy rainfall ensued. The whirling motion possessed by the cloud was almost at right angles to that of a waterspout, since in the latter the point of the cone extends nearly straight downward.

PERIODIC FLUCTUATIONS OF THE GREAT LAKES.

Mr. F. Napier Denison, of the Meteorological Service of Canada, and who has just been assigned to duty in British Columbia in order to build up a forecast system for that region, has lately published in the Canadian Engineer a paper on the "Great Lakes as a Sensitive Barometer." Mr. Denison seems to have begun the detailed study of the subject in 1896, and at once proceeded to construct a self-recording gauge showing the fluctuations of Lake Ontario at the mouth of the Humber River, 3 miles west of Toronto, on quite a large scale as to time and amplitude, viz, 1 inch of paper for an hour of time and a quarter of an inch of paper to an inch of fluctuation of the water level. A second self-recording apparatus was subsequently set up in September, 1896, at the Burlington Canal, at the southwest extremity of Lake Ontario, about 40 miles from Toronto. The records given by Mr. Denison's instrument are on a somewhat larger scale than those of the ordinary tide gauge, and in its latest construction Mr. Denison has added another record equivalent to that of a water barometer. Thus, on the same recording sheet we have the records of atmospheric pressure, and, therefore, the ability to make a minute comparison between this and the lake level.

1. Mr. Denison finds that when the lake record is least disturbed, so also is the barometric trace.

2. When the lake undulations become large and rapid so do the oscillations of the atmospheric pressure.

3. The larger undulations in the lake have a period that averages twenty minutes, and the smaller ones average ten minutes.

4. The lake level is never stationary, but the smallest movement recorded for twelve consecutive hours was from one-half to one inch when the pressure trace was also very quiet.

5. Mr. Denison further concludes that the longitudinal and transverse seiches in Lake Ontario are due to great differences of atmospheric pressure between the extremities of the lake, which differences are doubtless augmented when the gale strikes the surface of the water. The longitudinal seiche has a period of four hours and forty-nine minutes, but the transverse seiches only forty-five minutes. When the isobars, as shown on the daily weather maps, lie parallel with the axis of the lake, the seiche movement becomes almost imperceptible. These seiches appear shortly before the passage of some severe storm and for several days thereafter.

6. The rapid heaping up of the water at the upper end of the lake, which is due to great differences of pressure in conjunction with the action of the wind, sets up powerful currents at the top and bottom of the lake, and after this disturbance of water level is over the seiche or oscillation of the whole lake begins.

7. In connection with Helmholtz's paper on atmospheric billows Mr. Denison suggests that the smaller undulations are due to the direct action of the atmospheric waves or billows as they move over the surface of the lake.

8. That these undulations in the lake level become rapid and of great amplitude during fine weather and rising or